

## APPENDIX I

### Required Illicit Discharge Detection and Elimination (IDDE) Program Components

#### I. Outfall/Interconnection Inventory and Ranking

The outfall and interconnection inventory will identify each outfall and interconnection discharging from the MS4, record its location and condition, and provide a framework for tracking inspections, screenings, and other activities under the permittee's IDDE program. The required elements of the outfall and interconnection inventory and ranking procedures are described in this Part.

An **outfall** means a point source as defined by 40 CFR § 122.2 as the point where the municipal separate storm sewer discharges to waters of the United States. An outfall does not include open conveyances connecting two municipal separate storm sewers or pipes, tunnels or other conveyances that connect segments of the same stream or other waters of the United States and that are used to convey waters of the United States. (40 CFR § 122.26(b)(9)). However, it is strongly recommended that a permittee inspect all accessible portions of the system as part of this process. Culverts longer than a simple road crossing shall be included in the inventory unless the permittee can confirm that they are free of any connections and simply convey waters of the United States.

An **interconnection** means the point (excluding sheet flow over impervious surfaces) where the permittee's MS4 discharges to another MS4 or other storm sewer system, through which the discharge is conveyed to waters of the United States or to another storm sewer system and eventually to a water of the United States.

- A. Each outfall and interconnection must be assigned to one of the following categories:
  - 1. **High Priority Outfalls** are:
    - a. Discharging to an area of concern to public health due to proximity to beaches, recreational areas, drinking water supplies or shellfish beds;
    - b. Outfalls/interconnections where information indicates sewer input to the MS4

including, but not limited to, the following:

- i. Olfactory or visual evidence of sewage;
  - ii. Ammonia  $\geq 0.1$  mg/L<sup>1</sup>, surfactants 0.25 mg/L, bacteria levels greater than water quality standards applicable to the receiving water segment, or detectable levels of chlorine (typically  $> 0.02$  mg/L);
  - iii. EPA-generated data indicating the presence of illicit discharges, including, but not limited to, presence of pharmaceutical and personal care products (PPCPs);
  - iv. Water quality data provide by watershed groups performing sampling with an EPA- or State-approved quality assurance project plan (QAPP) demonstrating exceedance of water quality standards or the criteria referenced in Part I.A.1.ii, above.
2. **Low Priority Outfalls:** Outfalls/interconnections determined by the permittee as low priority based on the characteristics listed below or other available information.
  3. **Excluded outfalls:** Outfalls/interconnections with no potential for illicit discharges may be excluded from the IDDE program. This category is limited to roadway drainage in undeveloped areas with no dwellings and no sanitary sewers; drainage for athletic fields, parks or undeveloped green space and associated parking without services; cross-country drainage alignments (that neither cross nor are in proximity to sanitary sewer alignments) through undeveloped land.
- B. The permittee shall rank outfalls into the categories above (except for excluded outfalls) based on the following and update rankings as new information becomes available:
1. Dry weather screening/sampling results (Part 2 below).
  2. Past discharge complaints and reports.
  3. Poor receiving water quality—the following guidelines are recommended to identify waters as having a high illicit discharge potential: exceeding water quality standards for bacteria; ammonia levels above  $0.1$  mg/L<sup>2</sup>; surfactants levels greater than or equal to  $0.25$  mg/L, and/or detectable levels of chlorine (typically  $> 0.02$  mg/L).
  4. Density of generating sites—Generating sites are those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges. Examples of these sites include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas.
  5. Age of development and infrastructure – Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old will probably have a high illicit discharge potential. Developments 20 years or younger will probably have a

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<sup>1</sup> Unless the permittee can demonstrate through multiple repeated sampling events that detectable levels of ammonia are routinely present in background sources or groundwater inputs to the MS4, any detectable level of ammonia (equal to or greater than  $0.1$  mg/L using field kits or certified laboratory analysis) should be flagged as a potential indicator of sanitary sewage input.

<sup>2</sup> Unless the permittee can demonstrate through multiple repeated sampling events that detectable levels of ammonia are routinely present in background sources or groundwater inputs to the MS4, any detectable level of ammonia (equal to or greater than  $0.1$  mg/L using field kits or certified laboratory analysis) should be flagged as a potential indicator of sanitary sewage input.

low illicit discharge potential.

6. Sewer conversion – contributing catchment areas that were once serviced by septic systems, but have been converted to sewer connections may have a high illicit discharge potential.
7. Historic combined sewer systems – contributing areas that were once serviced by a combined sewer system, but have been separated may have a high illicit discharge potential.
8. Surrounding density of aging septic systems – Septic systems thirty years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.
9. Culverted streams – any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.
10. Water quality limited waterbodies that receive a discharge from the MS4 or waters with approved TMDLs applicable to the permittee, where illicit discharges have the potential to contain the pollutant identified as the cause of the water quality impairment.
11. The permittee may also consider additional relevant characteristics, including location-specific characteristics; if so, the permittee shall include the additional characteristics in its written (hardcopy or electronic) IDDE program.

## **II. Dry and Wet Weather Outfall and Interconnection Screening and Sampling**

Dry and wet weather outfall and interconnection screening and sampling shall be conducted consistent with the requirements described in this Part.

### **A. Dry Weather Outfall And Interconnection Screening And Sampling**

1. Screening requirements for each outfall/interconnection:
  - a. the permittee shall record all of the following information and include it in the outfall/interconnection inventory and priority ranking:
    - i. unique identifier,
    - ii. receiving water,
    - iii. date of most recent inspection,
    - iv. dimensions,
    - v. shape,
    - vi. material (concrete, PVC),
    - vii. spatial location (latitude and longitude with a minimum accuracy of +/-30 feet,
    - viii. physical condition,
    - ix. indicators of potential non-stormwater discharges (including presence or evidence of suspect flow and sensory observations such as odor, color, turbidity, floatables, or oil sheen).
  - b. If an outfall/interconnection is inaccessible or submerged, the permittee shall proceed to the first accessible upstream manhole or structure for the observation and sampling and report the location with the screening results.
  - c. If no flow is observed, but evidence of illicit flow exists, the permittee shall revisit the outfall during dry weather within one week of the initial observation, if

practicable, to perform a second dry weather screening and sample any observed flow (proceed as in iv. below).

2. Where dry weather flow is found at an outfall/interconnection, at least one (1) sample shall be collected, and:
  - a. Samples shall be analyzed at a minimum for:
    - i. ammonia,
    - ii. chlorine,
    - iii. conductivity,
    - iv. salinity,
    - v. E. coli (freshwater receiving water) or enterococcus (saline or brackish receiving water),
    - vi. surfactants (such as MBAS),
    - vii. temperature, and
    - viii. pollutants of concern<sup>3</sup>
3. All analyses with the exception of indicator bacteria and pollutants of concern can be performed with field test kits or field instrumentation and are not subject to 40 CFR part 136 requirements. Sampling for bacteria and pollutants of concern shall be conducted using the analytical methods found in 40 CFR § 136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR § 136. Sampling for ammonia and surfactants must use sufficiently sensitive methods to detect those parameters at or below the threshold indicator concentrations of 0.1 mg/L for ammonia<sup>4</sup> and 0.25 mg/L for surfactants. Sampling for residual chlorine must use a method with a detection limit of 0.02 mg/L. Analysis of all parameters for a single sample shall occur concurrently to support a weight-of-evidence evaluation (i.e., the greater number of parameters met or exceeded in a single sample, and the magnitude of exceedances, shall for the basis for prioritization).
4. If no flow is observed, but evidence of illicit flow exists, the permittee shall revisit the outfall during dry weather within one week of the initial observation, if practicable, to perform a second dry weather screening and sample any observed flow.
5. Dry weather screening and sampling shall proceed only when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and no significant snow melt is occurring.

## B. Wet Weather Weather Outfall And Interconnection Screening And Sampling

### 1. System Vulnerability Factors

For each catchment and associated outfall or interconnection being investigated, the

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<sup>3</sup> Where the discharge is directly into a water quality limited water or a water subject to an approved TMDL the sample shall be analyzed for the pollutant(s) of concern identified as the cause of the impairment as specified in Appendix G.

<sup>4</sup> For the purposes of this Part, ammonia field kits with reference detection ranges of 0 mg/L, 0.25 mg/L, 0.5 mg/L, etc. are considered sufficiently sensitive.

permittee shall determine the need for wet weather screening and sampling by identifying System Vulnerability Factors (SVFs). The permittee shall identify and record the presence of any of the following specific SVFs for each catchment area and associated outfall or interconnection:

- a. History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages;
- b. Common or twin-invert manholes serving storm and sanitary sewer alignments;
- c. Common trench construction serving both storm and sanitary sewer alignments;
- d. Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system;
- e. Sanitary sewer alignments known or suspected to have been constructed with an underdrain system;
- f. Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints;
- g. Areas formerly served by combined sewer systems;
- h. Sanitary sewer infrastructure defects such as leaking service laterals, cracked, broken, or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer infrastructure, or other vulnerability factors identified through Inflow/Infiltration Analyses, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations.

2. EPA recommends the permittee include the following in their consideration of System Vulnerability Factors:
  - a. Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs;
  - b. Any sanitary sewer and storm drain infrastructure greater than 40 years old;
  - c. Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance);
  - d. History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance).
3. The permittee shall document the presence or absence of SVFs for each catchment, retain this documentation as part of its IDDE program, and report this information in Annual Reports. Catchments with a minimum of one (1) System Vulnerability Factor are subject to wet weather sampling requirements of part 2.3.2 below.

#### C. Wet Weather Screening and Sampling Requirements

For all catchments with a minimum of one (1) SVF identified as outlined in Part 2.3.1. of Appendix I:

1. The permittee shall meet the requirements above for dry weather screening
2. The permittee shall inspect and sample under wet weather conditions to the extent necessary to determine whether wet weather-induced high flows in sanitary sewers or high groundwater in areas served by septic systems result in discharges of sanitary flow

to the MS4.

3. The permittee shall conduct at least one wet weather screening and sampling at the outfall that includes the same parameters required during dry weather screening, part 2.2 of Appendix I above.
4. Wet weather sampling and screening shall proceed during or after a storm event of sufficient depth or intensity to produce a stormwater discharge. EPA strongly recommends sampling during the spring (March through June) when groundwater levels are relatively high.
5. The permit does not require a minimum rainfall event prior to wet weather screening. However, permittees may incorporate provisions that assist in targeting such discharges, including avoiding sampling during the initial period of discharge (“first flush”) and/or identifying minimum storm event intensities likely to trigger sanitary sewer interconnections.
6. This sampling can be done upon completion of any dry weather investigation but must be completed before the catchment investigation is marked as complete.

### **III. Requirements for each catchment investigation associated with an outfall/interconnection**

- A. A catchment investigation written procedure must contain the following (at a minimum):
  1. **Maps, historic plans and records, and other sources of data**, including but not limited to plans related to the construction of the storm drain and of sanitary sewers, prior work performed on the storm drains or sanitary sewers, board of health or other municipal data on septic system failures or required upgrades, and complaint records related to SSOs, sanitary sewer surcharges, and septic system breakouts. These data sources will be used in identifying system vulnerability factors within each catchment.
  2. A **manhole inspection methodology** that shall describe a storm drain network investigation that involves systematically and progressively observing, sampling and evaluating key junction manholes (see definition in Appendix A) in the MS4 to determine the approximate location of suspected illicit discharges or SSOs. The manhole inspection methodology may either start from the outfall and work up the system or start from the upper parts of the catchment and work down the system or be a combination of both practices. Either method must, at a minimum, include an investigation of each key junction manhole within the MS4, even where no evidence of an illicit discharge is observed at the outfall. The manhole inspection methodology must describe the method the permittee will use. The manhole inspection methodology shall include procedures for dry and wet weather investigations.
  3. **Procedures to isolate and confirm sources of illicit discharges** where manhole investigations or other physical evidence or screening has identified that MS4 alignments are influenced by illicit discharges or SSOs. These shall include isolation of the drainage area for implementation of more detailed investigations, inspection of additional manholes along the alignment to refine the location of potential contaminant sources, and methods such as sandbagging key junction manhole inlets, targeted

internal plumbing inspections, dye testing, video inspections, or smoke testing to isolate and confirm the sources.

## B. Catchment Investigations

For each catchment, the permittee must inspect key junction manholes and gather catchment information on the locations of MS4 pipes, manholes, and the extent of the contributing catchment. Catchment investigations shall be completed on all High and Low priority catchments, regardless of outfall screening and sampling results. For each catchment investigation the permittee shall include the following:

1. Infrastructure information collected during each catchment investigation shall be incorporated into the permittee's system mapping; the permittee will refine their catchment delineation based on the field investigation where appropriate.
2. SVF information shall be collected during each catchment investigation to identify which catchments will be subject to wet weather outfall screening. Some examples include: common (twin invert) manholes, directly piped connections between storm drains and sanitary sewer infrastructure, common weir walls, sanitary sewer underdrain connections and other structural vulnerabilities where sanitary discharges could enter the storm drain system during wet weather.
3. During dry weather, key junction manholes shall be opened and inspected systematically for visual and olfactory evidence of illicit connections (e.g., excrement, toilet paper, gray filamentous bacterial growth, or sanitary products present).
  - a. If flow is observed, the permittee shall sample the flow at a minimum for ammonia, chlorine and surfactants and can use field kits for these analyses.
  - b. The area draining to the junction manhole shall be flagged for further upstream investigation where sampling results contain: any detectable level of chlorine, surfactants, or ammonia; other pollutants indicating potential illicit discharges or SSOs; or visual or olfactory evidence indicating potential illicit discharges or SSOs,.
4. Key junction and subsequent manhole investigations will proceed until the location of suspected illicit discharges or SSOs can be isolated to a pipe segment between two manholes.
5. If no evidence of an illicit discharge is found, catchment investigations will be considered complete upon completion of key junction manhole sampling, unless wet weather screening and sampling is required.
6. Confirmation of Illicit source: Where the source of an illicit discharge has been approximated between two manholes in the permittee's MS4, the permittee shall isolate and confirm the source of the illicit discharge using more detailed methods as identified in their written procedure. For outfalls that contained evidence of an illicit discharge, catchment investigations will be considered complete upon confirmation of all illicit sources. The period between detection and elimination of an illicit discharge is not a grace period. See Part 2.3.4.d.ii of the Permit.